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FOCUS ON COVER CROPS AND NO-TILL SEEDING

Name	Martello Nadia Farm
Region	Ceppaiano, Pisa, Tuscany
Farm type	Arable land (wheat, sunflower, maize, soya)
Farm size	300ha

How long have you been farming?

I come from a family of farmers, both my grand-father and great-grandfather were involved in growing and cultivating orchards (apples and peaches), potato and maize in the Veneto region. Here in Tuscany, we started with 10ha of land in 1986. Currently the farm is partially owned (120ha) and partially rented (180ha).

Why did you decide to implement the practice(s)?

As we don't have livestock we can't use manure to improve soil organic matter. I have to devote a lot of time to maintaining soil organic matter (SOM) and maintaining soil fertility. A reduction of SOM results in an increasing demand for external inputs and therefore higher costs. Often this investment in fertilizer doesn't lead to an increase in yield. Use of cover crops in particular helps reduce costs. The soil is enriched with nitrogen so it is possible to limit the fertilization to phosphates only.

No-till seeding can be done with little labour input and can be implemented across several hectares easily. It can also be done on different fields at different times.

How have you incorporated no-till seeding and cover crops into your rotations?

On the sandy soils we rotate durum wheat, rapeseed and soft wheat. On the more fertile soils, we rotate wheat, sunflowers, maize or soybean. In the loamy soils, soya is preceded by hairy vetch (Vicia sativa). On the heavy clay soils, we rotate wheat, sunflowers and clover. Clover is particularly useful to delay the repetition of sunflowers and the diseases related to it. No-till seeding is adopted on the flat sandy fields. Wheat is then no-till sowed at the end of October. In this block rapeseed is cultivated with minimum tillage, whilst sunflower is usually sowed with no-till seeding.

Soil feasibility for no-till practice

Measure	Feasible	Not feasible
No-till seeding	Loamy soils (good soil structure), plane lands	Clay soils, hilly areas

What has been the biggest challenge? And how have you overcome it?

Adequate machinery can be very expensive. I was supported by RDP funds for the sunflower seeder. However, I had to pay for the wheat and sorghum seeder. There was a learning curve in order to carry out the no-till seeding. In the first year we harvested too late and this compromised the soil preparation for no-till seeding. The soil needs to be properly prepared in September-October, this implies an earlier harvest so the soil is free of crops from July.

How has the soil benefited from this change?

Soils under the no-till seeding show a progressive SOM increase and a workability which is significantly better than in soils under the conventional tillage. Also, soil biodiversity is benefiting from this practice as it leaves soil undisturbed. In order to appreciate the effects on soil structure, water retention, SOM, etc., between 3 and 5 years are needed.

Estimated impact on soil carbon (tC/ha/yr)

Cover crops	0,24
No-till seeding	0,28
Total	0,52

How have the yields been affected by this change?

In the long term, these conservation practices will be more productive (in terms of yield) than conventional practices. Although, in the short term, no difference in yields was recorded in wheat. Spring crops have tended to be within the standard yield figures, but this is dependent on successful emergence and ensuring the vetch (cover crop) doesn't grow intensively.

How has the farm business benefited from this change? What are the financial implications of making the change?

The overall cover crop operation (including the stubble incorporation/burial) costs 150€/ha and there is an overall costs saving of around 10%. The higher costs due to seeds and crop protection are offset by savings in fertilizer and fuel costs. Another advantage is that these practices allow farmers to adopt crop diversification and thus distribute the farm management production risks to a higher number of crops.

Farm-specific results from the economic analysis for cover crops and no-till (€ /ha)

Costs savings: 48 €/ha (-10%)

	With measure	Without measure	Result
Seed costs	127	83	+44
Fertiliser costs	179	215	-36
Crop protection	95	82	+13
Fuel costs	44	112	-68
Total	444	492	-48

Where did you get advice and support to make the change?

In terms of information, the two national journals "Agricultural Informer" and "Earth and Life" provide detailed information about the conservation practices. But farmers need to be in touch with other farmers, extension agencies, and the University. I received very important technical information from the University. Innovation needs to develop from an improved information exchange process amongst farmers.

What advice would you give to others thinking about the change

You need to make a long-term assessment of the effects derived from the implementation of the conservative practices. The effects are particularly complex and cannot be appreciated in a one-year cycle! Besides, the no-till seeding has to be conceived as a two-three years-practice and you need to consider the overall preparation.

For further information about these practices see the SmartSOIL toolbox:
http://smartsoil.eu/smartsoil-toolbox/about/

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